

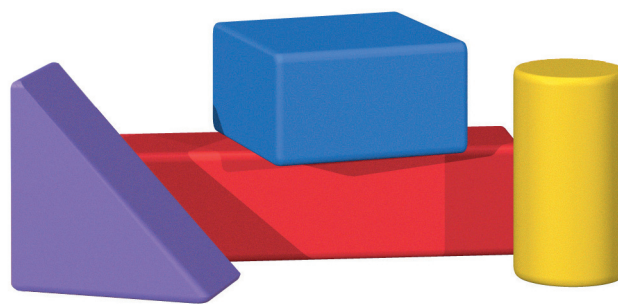


Virginia's Foundation Blocks for Early Learning:

Standards
for
Literacy, Mathematics,
Science, and
History and Social Science

2005
Virginia Department of Education

Virginia's Foundation Blocks for Early Learning: Standards for Literacy, Mathematics, Science, and History and Social Science



Prepared by
Office of Elementary Instructional Services
Virginia Department of Education

2005

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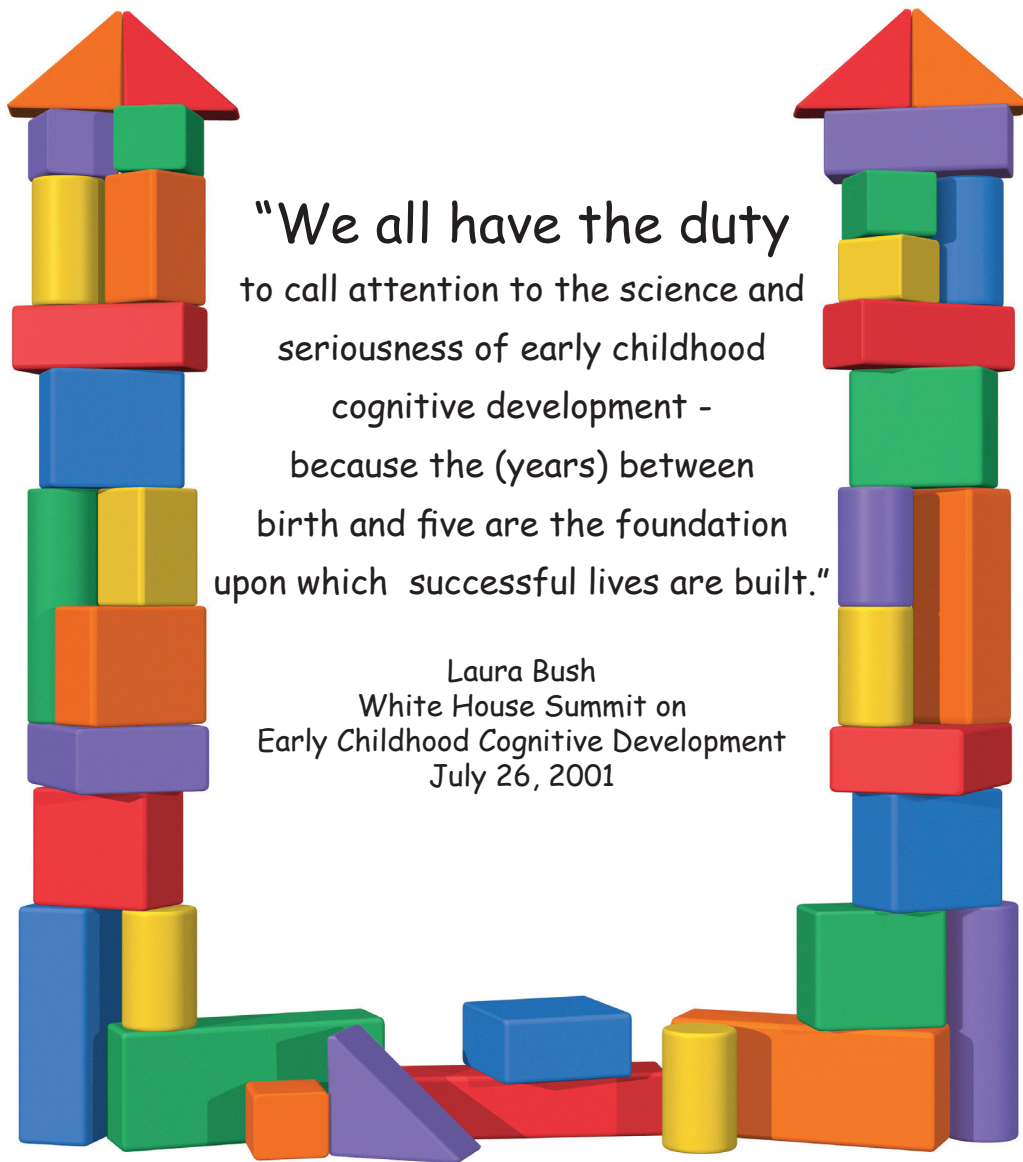
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NOTICE TO THE READER

Virginia's Foundation Blocks for Early Learning: Standards for Literacy, Mathematics, Science, and History and Social Science can be found in PDF file format on the Virginia Department of Education's Web site at <http://www.doe.virginia.gov>.

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"We all have the duty
to call attention to the science and
seriousness of early childhood
cognitive development -
because the (years) between
birth and five are the foundation
upon which successful lives are built."

Laura Bush
White House Summit on
Early Childhood Cognitive Development
July 26, 2001

Overview of Foundation Blocks

The value of early education is imperative to the future academic success and the growth of children's intellectual development in No Child Left Behind (2001). Virginia's Foundation Blocks for Early Learning: Standards for Literacy, Mathematics, Science, and History and Social Science attempts to establish a measurable range of skills and knowledge essential for four-year-olds to be successful in kindergarten.

The purpose of this document, then, is to provide early childhood educators a set of minimum standards in literacy, mathematics, science, and history and social science with indicators of success for entering kindergarten based on scientifically based research. The standards reflect a consensus of children's conceptual learning, acquisition of basic knowledge, and participation in meaningful and relevant learning experiences. Alignment to Virginia's Kindergarten Standards of Learning (SOL), to Virginia's Phonological Awareness Literacy Screening (PALS), and to the national guide, Teaching Our Youngest, A Guide for Preschool Teachers and Child-Care and Family Providers, produced by the Early Childhood-Head Start Task Force (2002), US Department of Education and US Department of Health and Human Services is evident.

The material is organized for use as a tool for early childhood educators in developing curriculum and meaningful classroom activities. Each Foundation Block is in box format, and is organized to build towards the Virginia Kindergarten Standards of Learning. Following the boxes, are expectation indicators for the Foundation Blocks. Sample teaching activities are included to assist teachers in the planning of meaningful classroom activities. Helpful terms and references to national consensus documents used in the development of this document are cited for clarification and resource purposes.

Limited English Proficiency (LEP)

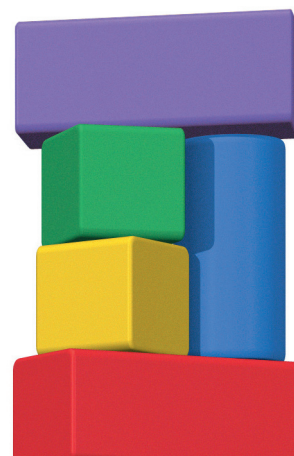
Educators recognize that children with limited English proficiency come to school with previously acquired knowledge and learning as a result of the language used in their home. For young children, the language of the home is the language they have used since birth, the language they use to make and establish meaningful communicative relationships, and the language they use to begin to construct their knowledge and test their learning. The home language is directly tied to the children's culture, values, and attitudes.

Just as children learn and develop at different rates, individual differences exist as LEP children acquire English. For example, some children may experience a silent period while they acquire English; other children may practice their knowledge by mixing or combining languages; still other children may seem to have acquired English language skills, but are not truly proficient; others will quickly acquire English-language proficiency. Each child's progress in learning a new language should be viewed as acceptable, logical, and part of the ongoing process of learning a new language.

The types of instructional activities typically present in early childhood programs facilitate the development of English for LEP children. Some examples of such activities are: using realia, hands-on activities, repetition, visual representations, and experiential activities. All of these activities provide a context for learning, critical for all children, but especially critical for LEP children.

Young LEP children may seem to be fluent and at ease with English, but may not be fully capable of understanding or expressing themselves in the more complex aspects of

language. Although LEP children may seem to be speaking a second language with ease, speaking a language does not equate to being proficient in that language. They may demonstrate weaknesses in language learning skills, including vocabulary skills, auditory memory and discrimination skills, simple problem-solving tasks, and the ability to follow sequenced directions. Typically, these deficiencies tend to disappear for young LEP children within one to two years of direct instruction in English.



Standards for Literacy

Introduction

Becoming a successful reader is dependent upon children's experiences and knowledge in listening, speaking, reading, and writing. Given quality opportunities to interact with responsive adults and peers in language and print rich environments, young children develop knowledge of the world around them through listening and speaking skills, phonological awareness, letter knowledge and print awareness, comprehension, vocabulary and word meanings, and writing. The following are definitions based on scientifically based reading research that will help frame the categories of Literacy Foundation Blocks.

Oral language experiences include communication activities that focus on speaking and listening. Educators and caregivers of young children must engage them in conversation throughout a daily and consistent routine, asking open-ended questions and presenting new words to allow expansion of vocabulary. In addition, being responsive to children's questions and allowing them to lead the conversation are essential in building oral language skills.

Reading begins early with the connection that print and sound are related, and occurs through daily experiences predictive of early success in reading. Phonological awareness or the ability to notice and manipulate sounds in spoken language includes alliteration, or identifying the same beginning consonant sounds in a group of words, recognizing and producing rhymes, and segmenting, or separating individual syllables into sounds. Through these kinds of daily routine activities, young children begin to develop initial understandings about reading and how it relates to their surroundings.

Writing is intriguing to children as adults around them use it as a means of communication. Reading, language, and writing become intertwined as children develop and follow a sequence of progression through routine practice in classroom activities. Thus, it is imperative for teachers to allow this progression to take place and offer it in relation to other literacy activities.

Research concludes that children who progress well in literacy development are immersed in environments consisting of rich children's literature, varied and frequent language experiences, and many opportunities to write. Conversely, children who are not progressing to expectations benefit from more of these kinds of activities in addition to more explicit classroom experiences. By listening and telling stories, reading aloud on a routine basis, rereading familiar texts, and providing repeated opportunities to write, children will develop literacy skills for later reading success.



Literacy Foundation Blocks

Oral Language:

The child will develop listening and speaking skills by communicating experiences and ideas through oral expression.

The child will develop an understanding of words and word meanings through the use of appropriate vocabulary.

Reading:

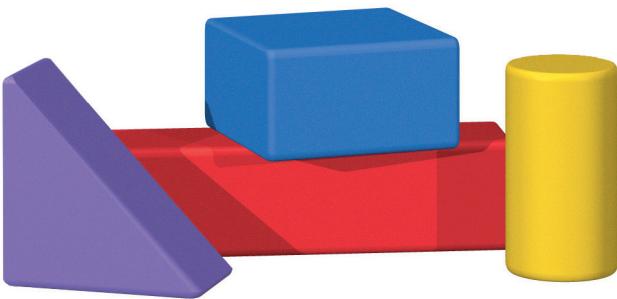
The child will manipulate various units of sounds in words.

The child will demonstrate basic knowledge of the alphabetic principle.

The child will demonstrate knowledge of print concepts.

Writing:

The child will write using a variety of media.





Virginia Literacy Foundation Block 1

Oral Expression

The child will develop listening and speaking skills by communicating experiences and ideas through oral expression.

ORAL EXPRESSION

Children gain language and vocabulary skills by having multiple and frequent opportunities to talk, as well as, listen to adults and peers. These opportunities must be daily and routine as children begin to read and write.

- a) Listen with increasing attention to spoken language, conversations, and stories read aloud
- b) Correctly identify characters, objects, and actions in a picture book, as well as stories read aloud, and begin to comment about each
- c) Make predictions about what might happen in a story
- d) Use two words to ask and answer questions that include actions
- e) Use appropriate language for a variety of purposes, e.g., ask questions, express needs, get information
- f) Engage in turn taking exchanges and rules of polite conversation with adults and peers
- g) Listen attentively to stories in a whole-class setting

Sample Activities

- ◆ Engage children in conversation throughout the daily routine.
- ◆ Respond to children's communication and allow the children to take the conversational lead.
- ◆ Present new words to expand vocabulary on a routine basis.
- ◆ Ask open-ended questions to elicit responses from children and ask follow up questions after a response to allow expansion opportunities.
- ◆ Play games to focus on listening carefully.
- ◆ Consistently reinforce rules of good listening and speaking in the daily routine.
- ◆ When reading aloud, provide opportunities for children to predict what will happen next, to comment on the story, and to connect the story to personal experiences.
- ◆ Retell stories and act out stories using props and puppets.



Virginia Literacy Foundation Block 2 Vocabulary

The child will develop an understanding of words
and word meanings through the use of appropriate vocabulary.

VOCABULARY

The more children know about the world around them, the easier it is for them to express new information, ideas and vocabulary in communicating this knowledge. Helping children to relate experiences to new ideas and concepts also assists in the development of vocabulary and related skills.

- a) Use single words to label objects
- b) Listen with increasing understanding to conversations and directions
- c) Follow simple, one-step oral directions
- d) Engage in turn taking exchanges with adults and peers
- e) Use new vocabulary with increasing frequency to express and describe feelings and ideas
- f) Expose children to a wide-variety of experiences to build vocabulary



Sample Activities

- ◆ Read books and stories aloud to children daily, e.g., The Enormous Watermelon, make a pretend garden by taping brown paper to the floor, tape seeds in a row and section off with masking tape; make garden signs with pictures of items related to gardening, e.g., rake, shovel, vegetables, potting soil, watering can, etc.
- ◆ Have children walk along the garden row and name the pictures on the garden signs.
- ◆ Read poems, sing songs and take field trips to build vocabulary.
- ◆ Provide daily opportunities for children to engage in conversations in dramatic play center by adding props related to themes.
- ◆ Play games like Simon Says, Red Light, Green Light.
- ◆ Offer children a wide variety of experiences for building vocabulary.



Virginia Literacy Foundation Block 3

Phonological Awareness

The child will manipulate the various units of sounds in words.

PHONOLOGICAL AWARENESS

Phonological awareness involves the understanding of sounds in spoken words, and is highly predictive of a young child's success in beginning to read. Children's abilities to manipulate sounds in spoken words and learning to read are connected through rhyming, common initial sounds (alliteration), blending and segmentation, all of which are equally important. Research shows that how quickly children learn to read often depends on how much phonological awareness they have when entering kindergarten.

- a) Discriminate similarities and differences in sounds (environmental, letter)
- b) Identify words that rhyme, generate simple rhymes
- c) Successfully detect beginning sounds in words
- d) Listen to multi-syllable words

Sample Activities

- ◆ Ask children to listen for a target sound, e.g., /t/. Have children put "thumbs up" if they hear the /t/ sound or thumbs down if they do not hear the /t/ sound at the beginning of words.
- ◆ Play rhyming word games, like making up new verses to familiar songs or rhymes OR replace familiar rhymes with silly ones, like "Humpty Dumpty", "Gumpty, Numpty".
- ◆ Target sounds in context through rhyming songs, poems, and raps. Raise your voice when the words rhyme.
- ◆ Use words from a story you have just read aloud. Ask children to listen to pairs of words and determine if they rhyme.
- ◆ Use picture and word sorts to assist in sound/letter discrimination (initial consonant: ball, boy, box, cat).



Virginia Literacy Foundation Block 4

Letter Knowledge and Early Word Recognition

The child will demonstrate basic knowledge of the alphabetic principle.

LETTER KNOWLEDGE AND EARLY WORD RECOGNITION

Letter knowledge is an essential component to begin reading and writing successfully. Functions of letters in writing and their connection to sounds are critical components in children's success in learning to read. In combination with phonological awareness, letter knowledge is the critical indicator to children's understanding of the alphabetic principle and the beginning connection to printed words.

- a) Correctly identify 10-18 alphabet (uppercase) letters by name in random order
- b) Select a letter to represent a sound (8-10 letters)
- c) Correctly provide the most common sound for 5-8 letters
- d) Read simple/familiar high-frequency words, including his or her name
- e) Notice letters around him/her in familiar, everyday life, and ask how to spell words, names or titles

Sample Activities

- ◆ The teacher will place large letter cards (bold print on 8 1/2 x 11 paper) in a circle on the floor. Play music and have the children march around the alphabet. When the music stops, the children stop and pick up a letter. Allow each child to give the name of the letter he or she is holding. To extend the activity, have the child give the sound that the letter makes and think of a word that begins with that sound.
- ◆ Provide varied forms of printed materials and props in centers for dramatic play. Some examples would include: menus, calendars, labels, pictures, and photographs with captions, recipes, envelopes with printed words, etc.
- ◆ Allow children to "type" on a computer keyboard. Encourage them to "type" their name and print it.
- ◆ Have children experiment and explore with various types of letters: magnetic letters, alphabet tiles, almost anything can be used to attach letters of the alphabet.
- ◆ Provide opportunities for children to trace, model, and create letters with paint, yarn, pipe cleaners, play dough, sand, pudding, shaving cream, etc.
- ◆ Use letter tiles, picture tiles, children's names to assist in letter knowledge and word recognition.



Virginia Literacy Foundation Block 5

Print and Book Awareness

The child will demonstrate knowledge of print concepts.

PRINT AND BOOK AWARENESS

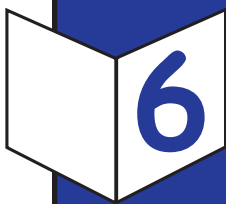
Through daily experiences with reading and writing, young children learn basic concepts regarding the printed word. They learn that print conveys meaning and pictures are representations of print. Young children begin to understand there is a correlation between spoken and written words by following the print as it is read aloud. An understanding that reading and writing are ways to obtain information and knowledge, generate and communicate thoughts and ideas, and solve problems is developed as young children routinely and consistently experiment with exploring books and print.

- a) Identify the front of a book
- b) Identify the location of the title of a book
- c) Identify where reading begins on a page (first word or group of words)
- d) Demonstrate directionality of reading left to right on a page
- e) Identify part of the book that "tells the story" (print as opposed to pictures)
- f) Turn pages one at a time from the front to the back of a book

Sample Activities

- ◆ The teacher displays a book, tells the children, "This is the front of the book", and reads the title of the book while pointing out each word, "This is the title of the book".
- ◆ The teacher opens the book, "We will read this page first," and continues modeling to point out first word, "we read this way," moving finger from left to right (tracking). This should become a routine daily practice when reading to children aloud (voice-to-print match).
- ◆ Teach the children the following song to the tune of Head, Shoulders, Knees, and Toes:

Top to bottom, left to right, left to right;
Top to bottom, left to right, left to right;
Top to bottom, left to right, left to right;
Top to bottom, left to right, left to right.
- ◆ Introduce various forms of print and talk about why people read with different types of print. Forms of print can include: non-fiction topic books, how-to books, poetry books, and storybooks.
- ◆ Read aloud daily.
- ◆ Provide a variety of print materials, i.e., magazines, logos, signs.



Virginia Literacy Foundation Block 6

Written Expression

The child will write using a variety of materials.

WRITTEN EXPRESSION

Through early writing experiences, young children develop understandings about the functions of written language. Children develop an awareness that ideas can be written. They begin to generate ideas about how written language works and explore its uses. Young children's attempts to write through scribbling, forms, and inventive spellings help them to understand writing as a means to communicate ideas and information. Over time, attempts at early writing will more closely align to conventional writing.

- a) Distinguish print from pictures
- b) Copy or write letters using various materials
- c) Print first name independently
- d) Print 5 - 8 letters with a writing tool
- e) Copy 3 - 5 letter words
- f) Use inventive spellings to convey messages or tell story

Sample Activities

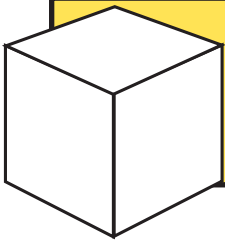
- ◆ Place baking flour (various other materials like shaving cream, pudding, paint, sand etc.) in tray and alphabet cards on a table. Have children use their finger to copy letters, drawing them in the flour. After a letter is copied, the child can gently shake (wipe) the tray to "erase" the letter and copy the next letter. This activity can be expanded for copying names and short words.
- ◆ Provide opportunities for children to write in a variety of contexts.
- ◆ Place clipboards with unlined paper and a variety of writing materials (colored pencils, crayons, markers) in learning centers.
- ◆ Provide a classroom Post Office.
- ◆ Encourage children to "write" about their play, e.g., what they build in the block center, grocery lists in the dramatic play center, etc.
- ◆ Encourage children to dictate words, phrases, or sentences to an adult to record on paper.

Standards for Mathematics

Introduction

Young children are natural learners, and they bring informal mathematics knowledge and experiences to the preschool classroom. They continually construct mathematical ideas based on their experiences with the environment, their interactions with adults and other children, and their daily observations. Children approach new tasks with curiosity and a sense of experimentation. Mathematics learning

builds on these characteristics of young children, and challenges children to explore ideas about patterns and relationships, order and predictability, and logic and meaning. Appropriate instruction occurs in environments that are rich in language, encourage children's thinking, and nurture children's explorations and ideas. These ideas include the concepts of number, pattern, measurement, shape, space, and classification.



Mathematics Foundation Blocks

Number and Number Sense:

The child will count with understanding, and use numbers to tell how many, describe order, and compare.

Computation:

The child will recognize change in groups (sets/collections).

Measurement:

The child will identify and compare the attributes of length, capacity, weight, time, and temperature.

Geometry:

The child will describe simple geometric shapes (circle, triangle, rectangle, and square) and indicate their position in relation to him/herself, and to other objects.

Data Collection and Statistics:

The child will participate in the data gathering process in order to answer questions of interest.

Patterns and Relationships:

The child will identify simple patterns of concrete objects and use them to recognize relationships.



Virginia Mathematics Foundation Block 1

Number and Number Sense

The child will count with understanding, and use numbers to tell how many, describe order, and compare.

NUMBER AND NUMBER SENSE

Young children enter pre-school with a foundation of experiences with number. To grow in an understanding of number and develop number sense, children must have daily experiences involving comparison and counting in ways that are personally meaningful and challenging.

- a) Count objects to 20 or more
- b) Count a group (set/collection) of three to five objects by touching each object as it is counted and saying the correct number (one-to-one correspondence)
- c) Count the items in a collection of one to five items and know the last counting word tells "how many"
- d) Compare two groups (sets/collections) of matched objects (less than five) and describe the groups using the terms more, fewer, or same

Sample Activities

- ◆ Include counting as part of the daily routine (lunch count, attendance, distributing snack items).
- ◆ Provide collections of three to five objects (buttons, plastic animals, plastic lids, keys) that encourage counting.
- ◆ Read counting books.
- ◆ Encourage one-to-one correspondence as children hand out materials (one item for each child).
- ◆ Include counting as a part of special classroom activities and materials (recipes, recording science observations, names).
- ◆ Ask children, as they line up, who is first in the line, second, third. As children participate in races on the playground, ask who crossed the line first, second, third (ordinal numbers).
- ◆ Provide opportunities for rote counting which involves saying the numbers or singing the numbers as far as children can count in the correct, memorized order. Similar to reciting or singing the alphabet song, children need many experiences saying the number names in sequence before they are able to count meaningfully.

Virginia Mathematics Foundation Block 2

Computation

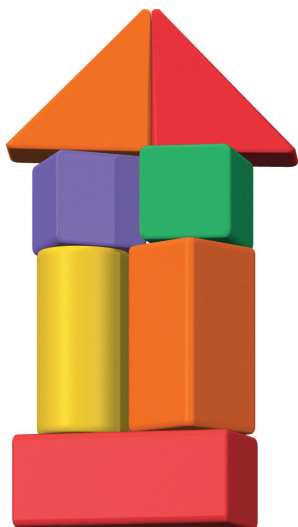


The child will recognize change in groups (sets/collections).

COMPUTATION

Young children notice the effects of increasing or decreasing the items in a collection of objects. To develop an understanding of computation children need many opportunities to match and count objects to find out more dependably which quantity is more, and to use counting to describe changes in a set.

- a) Describe changes in groups (sets/collections) by using more when groups of objects (sets) are combined (added together)
- b) Describe changes in groups (sets/collections) by using fewer when groups of objects (sets) are separated (taken away)



Sample Activities

- ◆ Tell stories and have the children use counting objects (toy cars, toy animals, cookie shapes) to solve problems involving adding together or combining groups. For example, "A mama bear and a daddy bear are walking in the woods with their two baby bears. How many bears altogether?"
- ◆ Describe stories where groups or objects are taken away or separated. For example, "Three cars were parked in front of the school, then two cars drove away; how many are left? Five goldfish swam in the aquarium; the teacher used a net to take two out. How many goldfish are left in the aquarium?" Have the children use goldfish crackers or toy cars to show what happens in each story.
- ◆ Use predictable fingerplays and traditional counting songs, i.e., "Five Little Monkeys", "Ten in the Bed" to practice adding and taking away objects. Have children act out the songs and fingerplays or use finger puppets to represent the characters as they determine how many are left or how many are added.



Virginia Mathematics Foundation Block 3

Measurement

The child will identify and compare the attributes of length, capacity, weight, time, and temperature.

MEASUREMENT

Children naturally make comparisons. From a very young age on, children are comparing who is taller and who has more. Comparison is the first step in developing an understanding of measurement. Young children should be immersed in activities that allow them to use their senses to make these direct comparisons. They should also be exposed informally to tools that are used for measurement.

- a) Recognize attributes of length by using the terms longer or shorter when comparing two objects
- b) Know the correct names for the standard tools used for telling time and temperature; and measuring length, capacity, and weight (clocks, calendars, thermometers, rulers, measuring cups, and scales)
- c) Use the appropriate vocabulary when comparing temperatures, e.g., hot, cold
- d) Use appropriate vocabulary when describing duration of time, e.g., hour, day, week, month, morning, afternoon, night, day

Sample Activities

- ◆ Ask children to match two pencils or crayons of different lengths, by matching one end of the object with the end of the object being compared. Ask the children to tell which of the two objects is longer and which is shorter. Provide children with opportunities to compare many examples of length, i.e., lines of children, lines of cups on a table.
- ◆ When using the standard tools for telling time and measuring attributes of length, capacity, and weight (clocks, calendars, balance scales, thermometers, rulers, measuring cups) in daily routines and activities, have children use the correct terms for the tools.
- ◆ Plan food preparation activities to include the use of clocks, thermometers, and balance scales.
- ◆ Explore the concept of weight by holding two different objects and determining which one is heavier, labeling one heavier and the other lighter. Children can also begin to place objects on a balance scale and determine if they balance (weigh the same), or if one pan is lower than the other (the object weighs more). Making discoveries and predictions using skills related to balance leads to standard measurement experiences.



Virginia Mathematics Foundation Block 4 Geometry

The child will describe simple geometric shapes (circle, triangle, rectangle, and square) and indicate their position in relation to him/herself and to other objects.

GEOMETRY

Geometry for young children involves observing and describing the shapes that are found everywhere in their environment. Children naturally use geometric shapes and spatial comparisons as they begin to express themselves through drawing and constructions. This familiarity is a foundation for learning experiences involving shape, position, and orientation in space.

- a) Match and sort shapes (circle, triangle, rectangle, and square)
- b) Describe how shapes are similar and different
- c) Recognize shapes (circle, triangle, rectangle, and square) by pointing to the appropriate figure when the teacher names the shape
- d) Describe the position of objects in relation to other objects and themselves using the terms next to, beside, above, below, under, over, top, and bottom

Sample Activities

- ◆ Provide opportunities for children to find shapes in their environment, inside and outside the classroom. They should find some that are similar and different, and use the appropriate language to describe how they are similar and different.
- ◆ Create cutouts of shapes (circle, triangle, rectangle, and square) out of various types of materials (plastic lids, construction paper, cardboard, fabric). Have children use the cutout shapes to sort into groups. Have children describe the ways they have sorted the shapes, i.e., by color, shape, number, and texture. Encourage the children to label the shapes with the appropriate terms.
- ◆ Introduce children to three-dimensional shapes through everyday experiences with cans (cylinders), balls (spheres), and playground cones or ice-cream cones. Teachers can describe these objects and refer to their mathematical names.
- ◆ Provide children with a variety of materials to make shapes by tracing around cutouts of shapes and combining them to create pictures.
- ◆ Provide many opportunities for children to build with blocks (unit blocks, legos, discovery blocks) giving children meaningful experiences using geometric shapes.



Virginia Mathematics Foundation Block 5

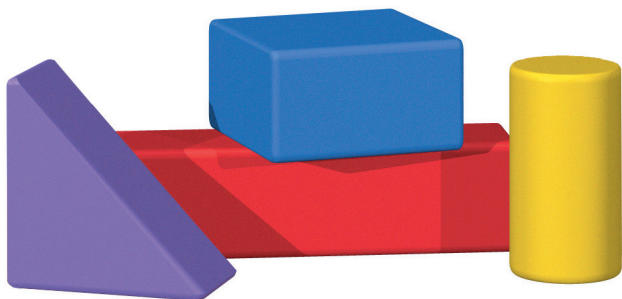
Data Collection and Statistics

The child will participate in the data gathering process in order to answer questions of interest.

Data Collection and Statistics

Children are natural questioners; they start asking questions and finding out opinions from a young age. To build upon this strength, children need to ask questions, collect answers, and then talk about what they found out. Analyzing data is a key step in making sense of information and the world around us.

- a) Collect information to answer questions of interest to children
- b) Use descriptive language to compare data in objects and picture graphs by identifying which is more, fewer, or the same



Sample Activities

- ◆ Provide opportunities for children to participate in the process of collecting data about a question, i.e., "How did you come to school today?" Children can place a picture of a car, bus, or a person walking on a graph to indicate the way they traveled to school. Toy vehicles and toy people may be used as well. Ask questions about the graph once it is complete, i.e., "Which way of traveling, by car, by bus, or walking, was used by more children? Which way was used by fewer children?"
- ◆ Use the children themselves to create a real graph of the data. For example, have children stand in groups by the types of shoes they are wearing. Now have them count the number of children who have each type of shoe. Record the information in a picture graph for children to use in comparing the data. Ask questions about the picture graph.



Virginia Mathematics Foundation Block 6 Patterns and Relationships

The child will identify simple patterns of concrete objects, and use them to recognize relationships.

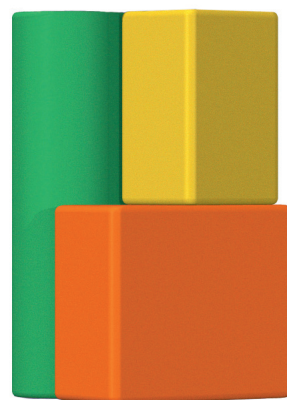
PATTERNS and RELATIONSHIPS

Algebra begins with a search for patterns. Being able to identify patterns allows young children to make generalizations and predictions beyond the information directly available. The recognition and analysis of patterns are important components of a child's intellectual development. Children should have many opportunities to engage in pattern related activities and recognize patterns in their everyday environment.

- a) Sort and classify objects according to one or two attributes (color, size, shape, and texture)
- b) Identify and explore simple patterns, i.e., AB, AB; red, blue, red, blue
- c) Use patterns to predict relationships between objects, i.e., the blue shape follows the yellow shape, the triangle follows the square

Sample Activities

- ◆ Provide children with objects, i.e., beads, buttons, rocks, bear counters for sorting by attributes. The teacher asks children to describe (classify) their sort.
- ◆ Provide children with many opportunities to observe patterns in the environment, i.e., in clothing, buildings, brick walls, etc. Patterns are part of the world in which we live. The child should be helped in becoming aware of patterns and ways to make patterns.
- ◆ Involve children in predicting patterns when lining up children by starting the line with a boy, a girl; a boy, a girl. Have the children predict who would come next.

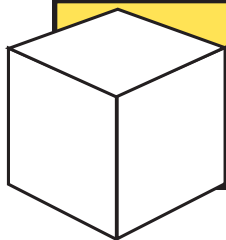


Standards for Science

Introduction

Preschool children are naturally curious about the world around them. These young learners frequently ask parents and teachers to explain why things happen. They are eager to see, listen to, touch, smell and taste things they encounter within their daily lives. At the same time, they are developing skills for effective communication and they are learning to work with other children. This natural curiosity provides the basis for understanding and using science process

skills. Preschool education provides an opportunity for students to experience the "big ideas". This is fundamentally important since children will vary widely in their previous experiences of using science process skills with such topics as life processes and properties of familiar materials, such as magnets and water. Through phenomena including shadows, patterns of weather, and plant growth, students are introduced to the concept of change. The significance of natural resources and conservation is also introduced in the preschool standards.



Science Foundation Blocks

Scientific Investigation, Reasoning, and Life Processes:

The child will make observations, separate objects into groups based on similar attributes, compare lengths and mass, and develop questions based upon observations using the five senses.

Force, Motion, and Energy:

The child will describe and categorize properties of materials using magnets

Matter:

The child will develop language to describe an object's position, movement and physical properties. The child will also describe properties of water and its movement.

Life Processes:

The child will compare the growth of a person to the growth of a plant and an animal to be able to describe basic life processes and basic needs of each.

Interrelationships in Earth/Space Systems:

The child will be able to create a shadow.

Earth Patterns, Cycles, and Change:

The child will identify simple patterns in his/her daily life. The child will identify things that change over time.

Resources:

The child will practice reusing, recycling and conserving energy on a daily basis.



Virginia Science Foundation Block 1

Scientific Investigation, Reasoning, and Logic

The child will make observations, separate objects into groups based on similar attributes, compare lengths and mass, and develop questions based upon observation using the five senses.

Scientific Investigation, Reasoning, and Logic

Young children have been observing the world around them since birth. This block will help children to develop language to describe their observations. It will teach them to make more careful observations, sometimes with the aid of tools, and to notice patterns within their observations. It should be noted that while some activities may be done to develop process skills alone, process skills are best used in conjunction with other big ideas. For example, observations of leaves provide ample opportunities to tie in discussions about color, shape and living things.

- a) Identify basic properties of objects by direct observation
- b) Describe objects using pictures and words
- c) Sequence objects according to size
- d) Separate a set of objects into two groups based on one physical attribute
- e) Compare the length and mass of different objects
- f) Identify the body parts that correspond with each of the five senses

Sample Activities

- ◆ Have students collect pinecones. Use the five senses to describe how the pinecone looks, feels and smells. Fill the pinecones with peanut butter and hang outside for birds. Use pictures to identify birds that come to the feeder. Have students listen for bird songs and try to imitate the sounds.
- ◆ Have students assist teacher in lining up stuffed animals for a "parade" from smallest to tallest.
- ◆ Store all "like" toys together. All legos go in one bin, all blocks in another, etc. Place pictures on the front of bins to assist children. As children progress, sort them into more specific categories such as all blue legos, all red legos.
- ◆ Sort items (plastic cookie cutters, fabric samples, buttons and beads, etc.) using different attributes, such as color, shape, size and texture.
- ◆ Compare the lengths of two objects by matching the end of one object with another. Objects to use may include shoes, books, and pencils. Discuss which is longer and which is shorter.



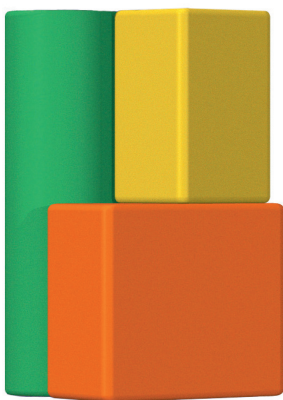
Virginia Science Foundation Block 2 Force, Motion and Energy

The child will describe and categorize properties of materials using magnets.

Force, Motion, and Energy

Children have probably seen a refrigerator magnet before. Some may have even taken these magnets and tried to stick them to other surfaces. Those that have experience with magnets may think that a magnet will attract any object with a shiny surface. Allow students plenty of time to play with magnets, as they are naturally motivating. Magnet activities provide wonderful center activities for students to explore in small groups and discuss together. [NOTE: Magnets should not be used on or around electronic equipment including TVs, computers, or clocks.]

- a) Describe the effects magnets have on other objects; they stick to some but not to others. Introduce the words "attracted to" and "not attracted to."
- b) Describe the effects magnets have on other magnets; they stick together or push apart.



Sample Activities

- ◆ Have students touch magnets to objects around the room. Have them describe what happened (they stick to some but not to others).
- ◆ Find five objects that are attracted to a magnet and five that are not.
- ◆ Have a magnetic "fishing" center. Tie a magnet to a piece of string and the string to a pencil. Place various magnetic and nonmagnetic items into a plastic container. Holding the fishing pole by the pencil, fish for anything that will stick to the pencil. Glue these to one piece of paper. Glue those that do not stick to another.
- ◆ Give students two magnets with like poles marked N and S. Have them touch the two North poles together. What happens? They push away. Have them touch a North end to a South end. What happens? They attract.
- ◆ Allow students to explore with magnetic toys such as the magic wand that allows children to move iron filings over the man's face, and the wooden train cars that connect together with magnets.



Virginia Science Foundation Block 3

Matter

The child will develop language to describe an object's position, movement and physical properties. The child will also describe properties of water.

Matter

Children are naturally drawn to objects of various colors and textures but often cannot describe what it is that they are observing. A rough piece of sandpaper may be described by a child as "sticky" (meaning that it catches his/her hand as it passes over the sandpaper) because he/she lacks the vocabulary to properly describe it. This block requires manipulation of objects to develop vocabulary that describes position, movement and physical properties of objects.

- a) Identify colors (red, orange, yellow, green, blue, purple) and white and black
- b) Identify shapes (circle, triangle, square, and rectangle) of an object
- c) Identify textures (rough/smooth) and feel (hard/soft)
- d) Describe relative size and weight (big/little, large/small, heavy/light, wide/thin, long/short)
- e) Describe position (over/under, in/out, above/below) and speed (fast/slow)
- f) Recognize water in its three forms (solid, liquid, gas)

Sample Activities

- ◆ Have shape scavenger hunts. Give students a paper shape, such as a circle. Ask them to search the room for objects with the same shape as the paper circle.
- ◆ Have students take a walk collecting any objects with an interesting feel or texture. Then have students sort them according to those that feel the same. Have students describe the way they feel. Make a whole group collage of like textures.
- ◆ Place an ice cube in a bowl and set it out on the windowsill. Come back in an hour or so. What happened to the ice? Leave the water there overnight. What happened to the water? Explain that water can be found as a solid (like the ice), liquid (like the water you drink) or a gas (like water vapor). Have students fill ice cube trays with water and place in the freezer to watch the process in reverse. Show students the water going into the air from a teakettle that is boiling. Place a pan that is filled with ice above the boiling teakettle. The water vapor going into the air will cool and collect on the pan. Then you have a liquid again.



Virginia Science Foundation Block 4 Life Processes

The child will compare the growth of a person to the growth of a plant and an animal and be able to describe basic life processes and basic needs of each.

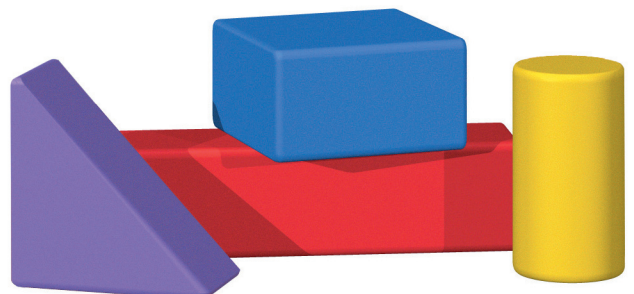
Life Processes

Babies, puppies, baby chicks, baby cows, etc., fascinate young children. Use this curiosity to teach them how some baby animals and adult animals are alike. Plants too, start as "babies" or seedlings and grow. Both plants and animals need food, water and air to live. Plants and animals can make new plants and animals.

- a) Describe what living things need to live and grow (food, water, and air)
- b) Recognize that "baby" plants and animals are similar but not identical to their parents and to one another

Sample Activities

- ◆ Have students grow a Hairy Harry. Have students draw a face on a styrofoam cup and fill with soil. Sprinkle with grass seed and water. Watch Harry's hair grow! What happens if you do not water Harry?
- ◆ Play matching games using picture cards with mother and baby animals, and a seedling and full-grown plant.
- ◆ Raise various animals in the classroom such as fish, guinea pigs, frogs, and mealworms.
- ◆ Ask children to bring in a baby picture. Compare their baby picture to the child. What has changed? What is the same? Show students pictures of animal babies and adults. What has changed? What is the same?





Virginia Science Foundation Block 5 Interrelationships in Earth/ Space Systems

The child will be able to create a shadow.

Earth/Space Systems

Students have likely seen their own shadows and shadows cast by other objects but may not be aware of how they were formed.

Allowing students opportunities to create and manipulate shadows provides them with an understanding that shadows are created when an object blocks light.

- a) Create a shadow and describe how it was created

Sample Activities

- ◆ Create a shadow screen by suspending a sheet between two tables. Place a strong light source behind the screen. Create several cardboard cutouts of various objects. Cast shadows on the screen by holding the cardboard in front of the light source. Ask children to identify the shape.
- ◆ Turn on a strong light source (such as an overhead projector) and allow students to hold an object in front of the light to create a shadow on a wall or screen. Allow students an opportunity to move the objects closer to and farther from the light. What changes? (the size) Why is there a shadow (the object is blocking the light).
- ◆ Take students outside and ask them to find their own shadow. Help students to trace their shadow. Why is there a shadow out here? (the light of the sun is blocked by their bodies)
- ◆ Allow students to retell a story (such as Goldilocks and the Three Bears) using shadow puppets.



Virginia Science Foundation Block 6 Earth Patterns, Cycles and Change

The child will identify simple patterns in his/her daily life.
The child will identify things that change over time.

Earth Patterns, Cycles and Change

Students and their parents naturally make daily weather observations when deciding what to wear and whether to carry an umbrella or bring a hat. They recognize routines of daily activities and know if they have brushed their teeth or had snack time. They are beginning to recognize patterns in other objects as well.

- a) Make daily weather observations
- b) Observe and classify the shapes and forms of many common natural objects including seeds, cones, and leaves
- c) Recognize the order or stages of animal and plant growth
- d) Describe home and school routines

Sample Activities

- ◆ Daily routines should include discussion of weather and include language such as sunny, cloudy, snowy, rainy and windy. Use cutouts of clouds, sun, raindrops, etc. to record weather on a daily calendar. At the end of each month, count the sunny days, rainy days, etc. Then remove cutouts one at a time and place them on a weather picture graph.
- ◆ Discuss how the day's weather influenced the clothes the child needed to wear.
- ◆ Collect leaves from the playground and make leaf rubbings with students. Ask students to describe rubbings and to tell how they are alike and different.
- ◆ Plant and observe a lima bean in various stages of growth.
- ◆ Have a picture/words daily schedule posted for children to see. Help them to create a daily schedule for home using cutouts of teeth to indicate brushing, food to indicate eating, bathtub to indicate bathing, etc. Glue the cutouts onto a sheet of paper in the order they are completed.



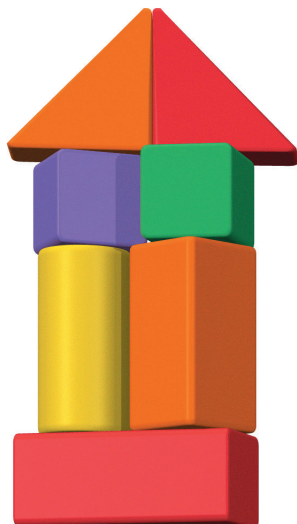
Virginia Science Foundation Block 7 Resources

The child will practice reusing, recycling and conserving energy on a daily basis.

Resources

Recycling for young children involves teaching children what they can do to help. The best way to learn about recycling is to have children do it. Some children may already be practicing recycling at home. The best way to learn to conserve water and energy is to teach children to practice these daily habits.

- a) Recognize that some objects can be recycled
- b) Recognize that some objects can be reused
- c) Identify ways that energy can be conserved



Sample Activities

- ◆ Ask students to bring in items from home that they recycle (or could recycle). Talk about what is recyclable.
- ◆ Keep a recycling bin in the classroom. Teach students to recycle paper, plastic and cardboard. Practice daily after lunch and art activities.
- ◆ Remind students of the importance of turning off water and lights.
- ◆ Keep a box of scrap paper for students to use to draw or practice writing.
- ◆ Have students talk to their parents about recycling.

Standards for History and Social Science

Introduction

Young children are explorers and adventurers interacting with those around them. The purpose of history and social science is to enable children to understand and participate effectively in their world. The energy, curiosity and imagination of

young children lead them to action and interaction within their surroundings. Foundational concepts and basic understandings are developed in history, geography, civics and economics at a very young age.



History and Social Science Foundation Blocks

History:

The child will identify ways in which people are alike and different.

The child will develop an awareness of change over time.

Geography:

The child will develop an increased awareness of the physical relationship between and among people and places.

The child will use words to indicate relative location of objects and people including direction words, comparison words and attribute words.

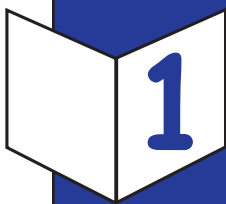
Economics:

The child will develop an increased awareness of the kinds of work people do and the variety of tools people use in their jobs.

The child will identify that people have wants and make choices.

Civics:

The child will participate as a member/ citizen of a classroom community.



History and Social Science Foundation

Block 1

History/Similarities and Differences

The child will identify ways in which people are alike and different.

Similarities and Differences

History makes links between the child and home, between school and the wider community, between past and present. It links reasoning and imagination and begins with the child's awareness of him or herself and others.

- a) Recognize ways in which people are alike and different
- b) Describe his/her own unique characteristics and those of others
- c) Make the connection that he/she is both a member of a family and a member of a classroom community
- d) Engage in pretend play to understand self and others
- e) Participate in activities and traditions associated with different cultural heritages

Sample Activities

- ◆ Read stories about children, families, schools and communities.
- ◆ Tell stories and have children act out the roles of the story characters.
- ◆ Have child draw or paint pictures about themselves, their classmates, and family.
- ◆ Create (class) books on differences among families and communities.
- ◆ Provide dramatic play opportunities for children to act out roles of various family members.
- ◆ Provide mirrors so children can see their own faces and the faces of their classmates. Note likenesses and differences.
- ◆ Introduce children to games, dance, music, and art from the different cultures represented in the classroom.



History and Social Science Foundation

Block 2

History/Change Over Time

The child will develop an awareness of change over time.

Change Over Time

Young children become aware of time through events specific to themselves and to people in their immediate surroundings. Begin the focus with the child's own history, then when grandparents were children and then to periods beyond living memory.

- a) Describe ways children have changed since they were babies
- b) Express the difference between past and present using words such as before, after, now, and then
- c) Order/sequence events and objects
- d) Ask questions about artifacts from everyday life in the past
- e) Recount episodes from stories about the past
- f) Take on a role from a specific time, use symbols and props, and act out a story/narrative
- g) Describe past times based on stories, pictures, visits, songs and music

Sample Activities

- ◆ Have children share a photograph or draw pictures of when they were babies and now.
- ◆ Collect and sort sets of baby clothes/toys and students' current clothes/toys.
- ◆ Read stories about birthdays. Make a timeline for years 1-4, and put writings and photos on the timeline.
- ◆ Play word games giving two events and have child tell which event came before and which came after.
- ◆ Have a share time with children bringing in books, toys, photos, etc., belonging to their parents or grandparents.
- ◆ Set up a class museum with old tools or everyday objects used long ago.
- ◆ Sort pictures into now and the past (long ago).
- ◆ Put pictures of daily routine activities in order from morning to night, or early in the day until late in the day.



History and Social Science Foundation Block 3 Geography/Location

The child will develop an increased awareness of the physical relationship between and among people and places.

Location

The energy, curiosity and imagination of young children lead them to action and interaction with their environment. Being egocentric, they view their world from a narrow, limited perspective. They grow in their understanding as they become more aware of themselves in the social settings of their daily experiences - home, school, neighborhood, and community.

- a) Identify and describe prominent features of the classroom, school, neighborhood and community
- b) Engage in play where one item represents another - miniature vehicles, people, blocks
- c) Make and walk on paths between objects- ex., from the door to the window
- d) Represent objects in the order in which they occur in the environment
- e) Experience seeing things from different elevations

Sample Activities

- ◆ Involve children in creating simple representations of home, school, or neighborhood through drawings or block construction.
- ◆ Provide real objects, models of objects, photographs, simple drawings or a child's developed symbol to use in block and dramatic play experiences.
- ◆ Create line paths using tape or chalk. Play games walking the lines from one object to another.
- ◆ Make a drawing with a picture of the two objects at the ends of the path and have one trace the path on paper as a child walks the path.
- ◆ Have the child walk around a basketball or a tennis court on painted lines or create closed shapes with tape or chalk. Play 'follow direction' games for stepping inside and outside the lines.
- ◆ Use flannel board pieces or real objects to arrange objects in the order they appear in the room.
- ◆ Provide experiences for aerial view of objects, looking down from steps, upper floor windows, top of sliding board, and standing over block constructions.



History and Social Science Foundation Block 4 Geography/Descriptive Words

The child will use words to indicate relative location of objects and people including direction words, comparison words, and attribute words.

Descriptive Words

As children learn more about their world, they use more words to express the new ideas and information needed to share what they know. Verbalizing helps children to solidify spatial concepts. Exposing children to a wide-variety of experiences helps build vocabulary. Students need to experience direction through movement and senses in order to describe their movements with words.

- a) Use words to indicate relative location
- b) Use words to describe features of locations in the environment and man-made structures found in stories and seen in everyday experiences
- c) Develop control in using direction words - on, under, over, behind, near, far, above, below, toward, and away - one direction at a time
- d) Develop control in using comparison words - closer, farther away, taller, shorter, higher, lower, alike, different, inside, and outside
- e) Develop fluency using attribute words - hard, soft, rough, smooth
- f) Use labels and symbols for what the child has seen

Sample Activities

- ◆ Read books and stories aloud to children daily noting location, direction, description and attribute words.
- ◆ Provide daily opportunities for children to converse in dramatic play and block play situations.
- ◆ Play games like "Simon Says", "I Spy", "Verbal Scavenger Hunt" giving directions to locate an object in the room.
- ◆ Sing songs like "The Hokey Pokey."
- ◆ Help students create labels and symbols for their block constructions and drawings.
- ◆ Help children create directions to parts of the school or playground and attach to photographs or pictures of the locations.



History and Social Science Foundation Block 5 Economics/World of Work

The child will develop an increased awareness of the kinds of work people do and the variety of tools people use in their jobs.

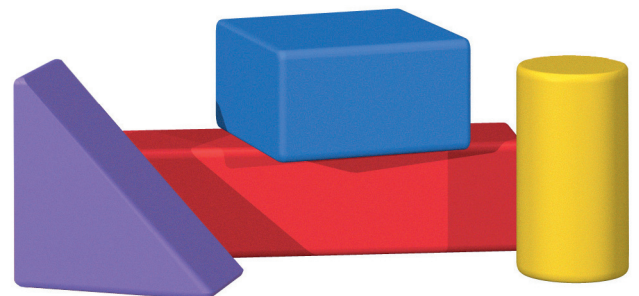
World of Work

The principles of economics influence everyday routines of life. Concepts and understandings develop when young children explore individual interests and build on their own experiences and what they already know. Their interest in the work people do and the tools they use provides a strong foundation for economic basics.

- a) Identify pictures of work and name the jobs people do
- b) Describe what people do in their community job
- c) Match tools to jobs
- d) Match job sites to work done
- e) Role-play the job of workers

Sample Activities

- ◆ Match pictures of workers and the tools they use to perform their job.
- ◆ Visit work sites (stores, building sites) in the neighborhood to explore jobs people do. Make a list in the classroom and have students draw pictures about these sites and workers.
- ◆ Have family members of the children share about their jobs and show tools they use.
- ◆ Invite workers to visit the classroom to talk about their job.
- ◆ Create a list of the workers in the school; add pictures and name labels of the people doing those jobs.
- ◆ Include hats, uniforms and tools as props for dramatic play.





History and Social Science Foundation Block 6 Economics/Making Choices

The child will identify that people have wants and make choices.

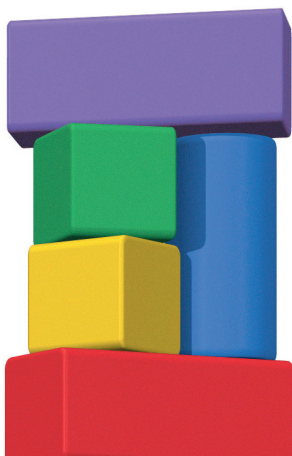
Making Choices

If young children are allowed to make choices, then making decisions for themselves as they grow becomes less difficult. Guiding young children to make simple choices will give them the experience and confidence to make good decisions on their own as they grow. Making good choices is at the heart of economic understanding and success.

- a) Identify choices
- b) Recognize that everyone has wants
- c) Choose daily tasks
- d) Role-play purchasing situations where choices are made

Sample Activities

- ◆ Read and discuss stories where characters are making choices.
- ◆ Make a list of wants. Ask children if they could choose two, what would they choose?
- ◆ Have children add to a class list one choice they made when selecting their snack for school.
- ◆ Provide choice board for center/work time activities.
- ◆ Role-play situations where choices must be made.





History and Social Science Foundation

Block 7

Civics/Citizenship

The child will participate as a member/citizen of a classroom community.

Citizenship

The early years are the ideal time for children to understand democratic norms and values (justice, equality, etc.) in their family, classroom and community. Applying these concepts to the nation and world will be easier if the child has experienced and appreciated them on a smaller scale. Democracies are built on the belief that people should be free, should have choices and opportunities, and should work together to make each other's lives better. To maintain our democratic society, we must teach our children to be good citizens.

- a) Cooperate with others in a joint activity
- b) Recognize the need for rules to help get along with others
- c) Participate in creating rules for the classroom
- d) State personal plans for learning center activities
- e) Participate in discussing and generating solutions to a class problem
- f) Share thoughts and opinions in group settings
- g) Demonstrate responsible behaviors in caring for classroom materials
- h) Identify the needs of other people by helping them

Sample Activities

- ◆ Read and discuss stories that show how problems can be solved. Act out or role-play these situations.
- ◆ Establish class rules and expectations.
- ◆ Start the day with a share time where each child may contribute to the class discussion.
- ◆ Use dramatic play, interviews, puppets, and other props to talk about behaviors and problems.
- ◆ Select a school project to help address a school problem or issue.
- ◆ Provide toys, books, and materials that encourage sharing, empathy, and cooperation.
- ◆ Plan group activities such as singing, dancing, and celebrations to focus on the class community.
- ◆ Have the children work together on one long-term common goal (plant a garden, take care of a class pet, keep a memory book).

Helpful Terms

Listed below are some terms one may encounter in reading more about early childhood education.

Alliteration The same consonant sounds at the beginning of words in a sentence, group of words, or a line of poetry. For example, the sound of "P" in Peter Piper picked a peck of pickled peppers.

Alphabetic principle The use of letters and letter combinations to systematically represent sounds/phonemes. For example, the word ship has four letters, but only three sounds/phonemes (sh-i-p).

Attributes These are the defining characteristics of an object.

Classify The description of how a student sorted objects by attributes (size, shape, color).

Cognitive development Children's development of knowledge and skills, which help them to think about and understand the world around them.

Decoding The translation of letters in written words into recognizable sounds and combining these sounds into meaningful words.

Emergent literacy The view that literacy learning begins at birth and is encouraged through participation with adults in meaningful literacy-related activities.

Environmental print Printed materials that are part of everyday life, including signs, billboards, labels, and business logos.

Explicit instruction Teaching children in a direct, systematic, and sequential manner.

Experimental writing Young children experiment with writing by creating pretend and real letters and by organizing scribbles and marks on paper.

Graphing The picturing of information in an organized manner, resulting in a graph. There are several types of graphs, including bar graphs and pictographs.

Invented spelling Phonemic-based spelling where children create their own nonconventional spelling.


Letter knowledge The ability to identify the names and shapes of the letters of the alphabet.

Journals Books in which young learners scribble, draw, and use their own spellings to write about their experiences.

Literacy Includes all the activities involved in speaking, listening, reading, writing, and appreciating both spoken and written language.

Model The hands-on materials, such as pictures, blocks, counters, and flash cards, which are used to demonstrate a concept. When you use these materials to represent a concept, you "model" the concept.

Non-standard units of measure Units of measure whose values may vary, such as a person's foot length, a handful, or paces. These are unlike standard units of measure, such as inches and pounds, whose values do not vary.

Number An abstract concept involving a quantity. For example, if you see  , you think of the number three.

Numeral The written symbols that represent a number. For example, "12" and "XII" are numerals for the number twelve.

One-to-one matching Matching one set of objects with another set of objects. For example, in a group of cups and saucers, you might match one cup with each saucer.

Ordering Placing a collection of items from largest to smallest or smallest to largest.

Ordinal numbers A number that tells the position of people or things in order.

Phonemes The smallest parts of spoken language that combine to form words. For example, the word hat is made up of three phonemes (h-a-t) and differs by one phoneme from the words pat, had and hot.

Phonics The relationships between the sounds of spoken language and the individual letters or groups of letters that represent those sounds/phonemes in written language.

Phonological awareness The ability to notice and work with the sounds in language. Phonological awareness activities can involve work with alliteration, rhymes, and separating individual syllables into sounds.

Picture Graph A type of graph that displays information as pictures on a chart.

Print awareness The knowledge that printed words carry meaning, and reading and writing are ways to obtain ideas and information. A young child's sensitivity to print is one of the first steps toward reading.

Rote counting Saying the names of the numbers starting with one: one, two, three, and so on.

Scaffolded instruction Instruction in which adults build upon what children already know and provide support that allows children to perform more complex tasks.

Set A collection of things belonging together according to a rule such as things that are all squares, red, or round.

Set counting Counting the number of objects together because they belong together for some reason.

Sight vocabulary Words a reader recognizes automatically without having to sound them out.

Sort Physical grouping of objects, based on attributes.

Spatial reasoning A sense of shapes and how they relate to each other.

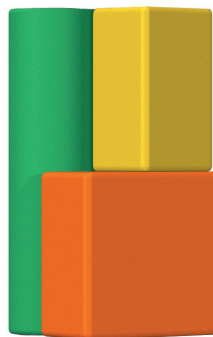
Statistics The science of assembling, classifying, and analyzing facts or data.

Unit measure A consistent quantity used for measuring, i.e., cube, block.

Vocabulary The words we know to communicate effectively. Oral vocabulary refers to words we use in speaking or recognize in listening. Reading vocabulary refers to words we recognize or use in print.

Volume The amount of space inside an object; the number of unit measures that it will take to fill the object. For example, the number of cups it will take to fill a gallon container is the volume of that container as measured in cups.

Word recognition The ability to identify printed words using strategies such as recognition by sight or decoding to determine meaning.



Resources

Listed below are additional resources that will provide more information about early childhood education. An * denotes a reference used for development of this document.

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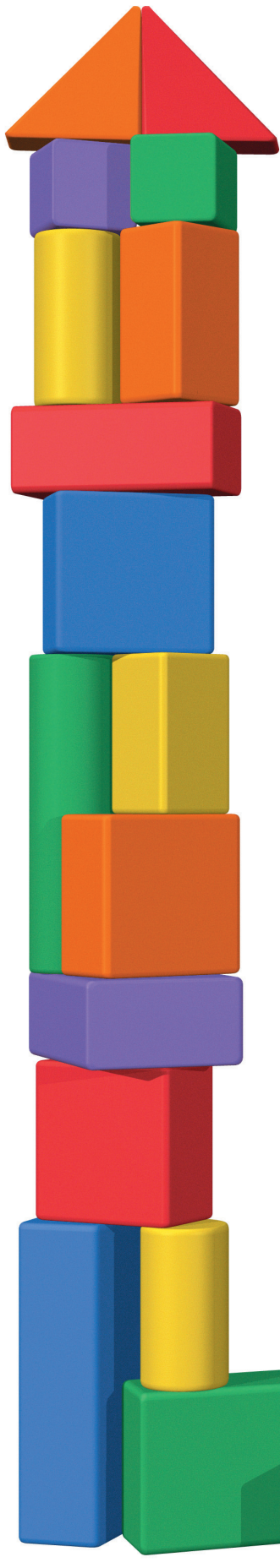
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